SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1103.—Vol. XXVI.] LONDON, SATURDAY, OCTOBER 11, 1856. [GRATIS.

BRITISH MINING, COMPARED WITH OTHER INVESTMENTS.

TABULAR STATEMENT, SHOWING THE RESULTS OF EACH.

BY MR. J. D. BRUNTON.

Class of investment.	Number of mines or companies.		Capital invested. Amount.	Capital invested. Totals.	Div. already received. Amount.	Div. already received. Per cent. on cap.	Div. now paying. Amount per annum.	Div. now paying. Per cent on cap.	Average capital to each undertaking.
Mines.—Copper—Dividend	26	...	£217,247	.....	£2,294,478	1056	£291,282	134	£8,355
Non-dividend	74	...	805,247	.....	.....	...	.....	...	10,800
Total	...	...	1,022,494	.....	.....	224	.....	28	
Not selling ores	7	...	55,598	.....	.....	...	.....	...	7,942
Total	...	107		£1,078,092	.....	213	.....	27	
Copper and Lead—Dividend	2	...	173,344	.....	239,096	140	7,000	4	86,672
Not selling ores	1	...	6,300	.....	.....	...	.....	...	6,300
Total	...	3		179,644	.....	133	.....	3¾	
Copper and Tin—Dividend	19	...	368,069	.....	957,955	233	91,094	24	19,372
Non-dividend	30	...	454,343	.....	.....	...	.....	...	15,145
Total	...	49		822,412	.....	116½	.....	11	
Tin—Dividend	19	...	282,403	.....	294,345	104	41,779	14	14,863
Non-dividend	34	...	225,884	.....	.....	...	.....	...	6,644
Total	...	53		508,287	.....	57	.....	8	
Silver-Lead—Dividend	8	...	156,550	.....	141,444	90	14,805	9½	19,568
Non-dividend	20	...	298,900	.....	.....	...	.....	...	14,945
Total	...	...	455,450	.....	.....	31¾	.....	3¼	
Not selling ores	3	...	9,819	.....	.....	...	.....	...	3,273
Total	...	31		465,269	.....	30¼	.....	3	
Lead—Dividend	20	...	206,316	.....	242,834	117½	57,810	28	10,315
Non-dividend	42	...	336,450	.....	.....	...	.....	...	8,000
Total	...	...	542,776	.....	.....	44¼	.....	10½	
Not selling ore	6	...	25,072	.....	.....	...	.....	...	4,178
Total	...	68		567,838	.....	43	.....	10	
Miscellaneous—Not selling ore	...	39	.....	137,474	.....	...	.....	...	3,715
Total	...	350	.....	£3,759,016	£4,170,152	111	£503,770	13½	£10,740
Dividend—Copper	26	...	£217,247	.....	£2,294,478	1056	£291,282	134	£8,355
Copper and Lead	2	...	173,344	.....	239,096	140	7,000	4	86,672
Copper and Tin	19	...	368,069	.....	957,955	233	91,094	24	19,372
Tin	19	...	282,403	.....	294,345	104	41,779	14	14,863
Silver-Lead	8	...	156,550	.....	141,444	90	14,805	9½	19,568
Lead	20=	94	206,316=	1,403,929	242,834	117½	57,810	28	10,315
Totals and averages	...	...	.....	.....	£4,170,152	296	£503,770	35¾	
Non-dividend (but selling ores)—Copper	74	...	805,247	.....	.....	...	.....	...	10,800
Copper and Tin	30	...	454,343	.....	.....	...	.....	...	15,145
Tin	34	...	225,884	.....	.....	...	.....	...	6,644
Silver-Lead	20	...	298,900	.....	.....	...	.....	...	14,945
Lead	42=	200	336,450=	2,120,824	.....	...	.....	...	8,000
Not selling Ores—Copper	7	...	55,598	.....	.....	...	.....	...	7,942
Copper and Lead	1	...	6,300	.....	.....	...	.....	...	6,300
Silver-Lead	3	...	9,819	.....	.....	...	.....	...	3,273
Lead	6	...	25,072	.....	.....	...	.....	...	4,178
Miscellaneous	39=	56	137,474=	234,263	.....	...	.....	...	3,715
Totals and Averages	...	350	.....	£3,759,016	£4,170,152	111	£503,770	13½	£10,740
Canals	23	...	£6,917,438	.....	.....	...	£261,535	3·75	£300,758
Bridges	4	...	2,300,457	.....	.....	...	24,037	1·04	575,114
Water-Works	7	...	2,812,066	.....	.....	...	155,415	5·33	401,724
Navigation	7	...	4,599,900	.....	.....	...	296,880	6·4	657,128
Gas	15	...	4,909,000	.....	.....	...	320,350	6·5	327,266
Docks	7	...	9,620,428	.....	.....	...	487,208	5·5	1,374,347
Land	7	...	2,198,413	.....	.....	...	66,971	3	314,059
Totals and averages	70	...	£33,357,702	.....	.....	...	£1,612,396	4·8	£476,538

To the capitalist, whether large or small, it is a question of vital importance in which of the many ways open to him he shall invest, so as at the same time to ensure large returns and incur small risk. He naturally looks with timidity at any new path which cannot show achieved successes, and wisely consults the statistics of the past in forming his decision. For his assistance, the foregoing table is compiled and spread before him, that he may choose which of the various classes of investment he will adopt.

The figures of a tabular statement only do not, however, give in its full breadth the comparison which it is desired to institute: the following considerations must likewise be borne in mind:—

1. With regard to Mining. By the accumulation of facts, and the general advancement in geological and mineral knowledge, mining is becoming constantly more and more uniformly correct in its inferences, judgments, and opinions; and, consequently, is yielding, for a given outlay, constantly augmenting ratio of profitable results. Also, all the mechanical appliances connected with mining operations are improved and improving, so that produce is increasing and cost diminishing. And the emancipation of the mining interests from bondage to the smelting monopoly—which must come sooner or later—will greatly increase the profits of the miner, so that a similar tabular statement for Oct., 1857, will, we confidently predict, set in a still stronger light the profitableness of this branch of our national industry.

2. As it regards the seven great classes of investment introduced in the table, there does not appear any probability of increase in the returns of any of them; and some have undoubtedly seen their best days, so that, on the whole, a decrease may be looked for. Joint-stock Banks and Insurance Offices are not included in the table, because, in the first place, they stand in an exceptional position, being out of the pale of limited liability; and in the next place they have, as investments, reached their culminating point, and are already beginning to feel the effect of extended competition. Neither are Railways included, because they have been singularly unfortunate. It would hardly have been fair to have swamped seven classes of investment, which pay 4¾ per cent. on a capital of 33,000,000*l.*, with one overwhelming class having a capital of 400,000,000*l.*, and paying only 2 per cent. Let it stand by itself.

The only remarks in explanation which we think required refer to the figures under the head "Per Centage on Capital." It will be observed that the ratio of dividend is calculated not only as against the mines which yield the dividends, but also as against the others in addition. Thus, in the case of copper mines; if one company had laid out the whole 1,078,092*l.*, they would have already received 2,294,478*l.*, and be annually receiving now 291,282*l.*, or 27 per cent. on their outlay.

MINING STATISTICS OF THE UNITED KINGDOM.—No. VIII.

BY ROBERT HUNT, ESQ., F.R.S.

COALS.

The following table exhibits the number of collieries at work in the different districts, and the quantities of coal raised, in 1855:—

District.	Collieries.	Produce.
Durham and Northumberland	273	Tons. 15,431,400
Cumberland	23	 809,546
Yorkshire	333	 7,747,470
Derbyshire	171	 2,256,000
Nottinghamshire	20	 809,400
Warwickshire	17	 262,000
Leicestershire	11	 425,000
Staffordshire and Worcestershire	500	 7,323,030
Lancashire	357	 8,950,000
Cheshire	52	 755,500
Shropshire	56	 1,105,250
Gloucestershire, Somersetshire, and Devonshire	88	 1,430,620

WALES.

In North Wales, the number of collieries at work was—Anglesea, 5; Montgomeryshire, 31; Denbighshire, 29. The total quantity of coals raised in all these districts was 1,125,000 tons.

The coal field around Ruabon is being more largely developed; the requirements of the district are large for the blast furnaces, &c., in Denbighshire, and for the lead-works in Flintshire. Beyond this, the Great Western Railway brought, in 1855, to London from Ruabon 10,000 tons, carried large quantities of coals into Staffordshire, and distributed 70,000 tons in Cheshire and the neighbourhood.

In South Wales, the collieries at work during 1855 were—Monmouthshire, 63; Glamorganshire, 117; Carmarthenshire, 47; Pembrokeshire, 18.

The total produce of the collieries of the Anthracite Districts was 997,500 tons; and of the Bituminous Districts, 7,552,770 tons.

SCOTLAND.

In Lanarkshire, Ayrshire, Renfrewshire, Dumbartonshire, Stirlingshire, Linlithgowshire, Peebles and Perth, Edinburgshire, Haddingtonshire, Clackmannan and Fife, are 403 collieries, the total produce of which was 7,325,000 tons.

Beyond the large quantities of coals used in the iron-works of the district, and in the numerous manufactories in and around Glasgow, much was sent by the Caledonian Railway.

It is estimated by Dr. John Strang, of Glasgow, that in the west of Scotland 2,152,800 tons were consumed in blast furnaces; 367,200 tons in the conversion of pig into malleable iron; and 2,853,427 tons in manufactures, steam-boats, and domestic consumption, in Glasgow.

IRELAND.

The Leinster, Tipperary, Munster, Connaught, and Tyrone coal fields of Ireland have 19 collieries at work. The produce of 1855 was—Anthracite or culm, or small, 95,000 tons; bituminous coals, 50,620 tons: total produce, 145,620 tons.

The total produce of the United Kingdom for 1855 was 64,453,070 tons; and for 1854, 64,661,401 tons: showing a decrease of 207,331 tons.

MINERAL WEALTH OF GREAT BRITAIN.—No. I.

In our Journal of Feb. 23, we inserted a full abstract of a highly valuable paper upon the Present State of the Mineral Industries of the United Kingdom, read by Mr. Robert Hunt, F.R.S., Keeper of Mining Records, Museum of Practical Geology, before the Statistical Society; but the entire paper having been published in the Society's Journal for September, we are enabled to append some additional information. In Cornwall and Devonshire, during 1854, 111 mines sold copper ore in quantities above 50 tons each: 3225 tons were sold by smaller mines, in quantities varying from 10 to 30 tons. Mr. Hunt then selects a few of the more productive mines, and gives, upon the best obtainable information, the direction of the lodes producing the metalliferous ores in relation to the true North, the kind of rock in which the ore is found, and the distance (approximate) of the lode from the junction of the clay-slate and granite:—

Name of mine.	Produce of ore in tons in 1854.	Average mean direction of lodes.	Rock in which worked.	Distance from junction, in chains.
Devon Great Consols	23,174	E. and W.	Clay-slate	40
Wheal Buller	12,208	25° S. of W.	Granite and slate	J.*
Wheal Basset	8,378	24° S. of W.	Ditto	J.
United Mines	11,827	27° S. of W.	Slate and granite	25
Tresavean	3,990	30° S. of W.	Ditto	J.
Carn Brea	6,231	30° S. of W.	Granite	J.
Fowey Consols	4,440	E. and W.	Slate	30
Alfred Consols	3,712	15° S. of W.	Slate and greenstone	J.
South Wheal Frances	2,783	20° S. of W.	Granite	20
West Caradon	4,018	E. and W.	Ditto	25
West Basset	5,231	18° S. of W.	Slate	J.
Tincroft	3,791	20° S. of W.	Slate and granite	J.
North Roskear	2,216	32° S. of W.	Slate and greenstone	30
Halamanning	2,508	20° S. of W.	Slate	20
Wheal Seton	4,945	15° S. of W.	Ditto	70
Botallack	1,453	20° W. of N.	Slate and greenstone	20
Levant	1,589	18° W. of N.	Ditto	20

These are selected as a few striking examples of the fact that nearly all our lasting and profitable copper mines have been in close proximity of two dissimilar rocks, and that the lodes have a main line of general direction. Immediately around the granite formations of the Constantine mass, and the granite hills of Carnmarth and Carn Brea, are grouped about 100 tin and copper mines, the greater number of which have been especially productive; and all these have a general direction of about 20° south of west. Amongst the group are the following, and the quantity of ore sold within the periods named is given:—

	Ore.	Value.
Tresavean, 1815 to 1854	Tons 234,402	..... £1,383,268 11 6
United Mines, ditto	282,848	..... 1,654,334 4 6
Dolcoath, ditto	240,214	..... 1,347,367 9 0
North Roskear	145,624	..... 853,102 16 0
South Roskear, 1821 to 1850	38,904	..... 210,332 8 6
Wheal Buller and Beauchamp, 1822 to 1846	65,804	..... 333,871 10 0
Wheal Unity, 1815 to 1852	112,410	..... 714,080 13 6
Wheal Damsel, 1815 to 1842	34,618	..... 258,497 16 6
Wheal Basset, 1815 to 1854	88,174	..... 607,365 10 6
Wheal Gorland, 1815 to 1848, and 1851	41,499	..... 254,808 14 6
Tincroft, 1815 to 1827, and 1834 to 1854	86,398	..... 363,076 1 6
Cook's Kitchen, 1815 to 1846	45,583	..... 179,627 14 6
Camborne Vean, 1815 to 1826, and Stray Park, 1826 to 1854	60,797	..... 335,729 12 0
Consolidated Mines, 1815 to 1854	435,408	..... 2,845,482 13 0
Wheal Jewel, 1815 to 1824, and 1829 to 1853	58,160	..... 400,190 13 6
Wheal Maid and Carharrack, 1820 to 1852	33,571	..... 191,460 12 0
Carn Brea Mines, 1833 to 1854	148,983	..... 852,385 3 0
East Wheal Crofty, 1832 to 1854	101,952	..... 534,816 12 0

Those mines only have been selected of which a correct return for several years could be obtained. An examination of the district around St. Austell will show that the same conditions prevail. The Liskeard and Callington mines observe similar orders of proximity, and around the edge of the great granite formations of Dartmoor, where the geological conditions are similar to those of Cornwall, productive mines are now developing themselves. The lead lodes of Western England are generally found at nearly right-angles to the lines of the copper lodes, their run being about north and south. The lead lodes of Flintshire have a main run from east to west, some few of them, however, running from south of east to north of west. The lodes of Alston Moor have also an easterly and westerly direction.

* J. signifies that the lode is chiefly productive along the line of junction.

COAL IN FRANCE AND BELGIUM, AND IN ENGLAND AND SCOTLAND.

Our valued correspondent, Mr. M. Dunn, the Government Mine Inspector, has recently read a highly interesting paper on this subject before the North of England Mining Institute, of which we make the following abstract:—For many years, the country around Paris drew its supply of coal, by means of canals, from the coal mines of Belgium, and the neighbouring coal field of Valenciennes; whilst Belgium also exported considerably to the Mediterranean, Holland, and Prussia. To encourage this trade, and as a boon to Belgium, the import duties into France were highly favoured, and would, in all probability, have continued so for many years to come, had the raising of coals in Belgium kept pace with the increased consumption, and especially had the Belgian collieries spiritedly carried out the progressive improvements of England, and thereby diminished the cost price, whilst arrangements were making for commanding the deep mines, and for an increased production, similar to what has taken place in England and Scotland.

That such improvement and consequent increase of production has not taken place may be known from Mr. Dunn's figures, from which it appears that the short supply, overtaken by increased demand, has produced prices so high as to prevent the collieries from competing for the supply of Paris, which has suggested a policy to the French Government of equalising the duties, and thus encouraging the importation of English coal. It becomes, therefore, an important question why such a state of things has overtaken Belgium—that instead of largely exporting coals, the wants of the country seem to demand a remission of import duties, and to encourage a supply of coal from England. It will not be alleged that such falling off arises from the exhaustion of the mines, but rather from the deficiency of attaining the numerous beds of coal, lying at unusual depths, which, of course, require a system of ventilation and enlarged engine power, beyond the routine of even the deepest collieries in the country. The coal seams of Belgium are much thinner and more numerous than those of Great Britain, and are generally accompanied by shales and soft metals, to which circumstance may be attributed the remarkable absence of water, which is particularly exemplified in the Hainault district by

the fact that, whilst there are 145 coal engines, equal to 3881-horse power, there are but 58 pumping-engines, equivalent to 5279-horse power, although many of the mines are upwards of 150 fms. in depth.

The coal field of Belgium is connected with that of the north of France in the neighbourhood of Valenciennes, Conde, Mons, Namur, Liege, and a considerable portion of the Duchy of Limburg, towards the Rhine, and contains in the centre of the basin no less than 134 workable seams of coal. In the neighbourhood of Mons 114 seams are well known, of which the Flenu group, containing 32 beds, is the richest. The first steam-engine for raising water was erected near Charleroi, in 1725, by M. Mesonne, of Liege, and in Mons, in 1735, by M. Goffint, of the same place. The working of coal at Liege is known to have commenced about the end of the 12th century, the first steam-engine for raising water being erected in the year 1723. In 1838, the number of working pits in Belgium was 480, and 172 were in course of sinking. The coal mines belong to the Government, and the custom has been to let so many seams to each person, giving power of access through each other's holdings, which custom is producing great inconvenience, and will take long to counteract. The exclusion of English coal by Napoleon I., and the encampment of the grand army at Boulogne in 1803-4-5, preparatory to an invasion of England, gave a great impulse to the Belgian coal trade. Numerous companies arose, and obtained great privileges from the Government, which in due time caused a serious reaction, especially in 1834. According to Mr. E. Tennent, M.P., between the years 1833 and 1838 not less than 150 joint-stock companies, called "sociétés anonymes," were formed, for the purpose of working the mines, carrying on glass-works, sugar refineries, &c., and that not less than 15,000,000*l.* sterling of capital were expended in these objects. Since 1830 capital, amounting to 4,000,000*l.* sterling, was raised in Belgium, for the purpose of working the coal mines. In 1838, the thirst for speculation had reached its maximum, the exorbitant premiums upon collieries and coal leases which had hitherto been paid were at an end, and a retrograde movement took place. The extent to which these speculations were carried on may be thus estimated:—In 1838, the "civil societies" possessed 224 out of the 307 Belgian collieries. The quantity of coal conveyed by the rivers in the neighbourhood of Mons into Flanders, Holland, and France, during 1838 was 1,198,300 tons. The quantity of coals raised in 1838 was 3,685,402 tons, of which 775,000 tons were exported to France and other countries.

Upon the subject of ventilation much has been written, and the opinions of several eminent authorities are quoted by Mr. Dunn. M. Boissé remarks that in the most extensive mine which he had visited the current was equal to 8 cubic metres per second, and it was subdivided into five branches, all of which were united before ascending the upcast pit. The greatest speed he ever saw was 1·20 metre per second; 1·50 metre will extinguish naked lamps. In many cases no artificial means are used to propel the ventilating current: sometimes a waterfall is employed, and also air-pumps; generally lamps or furnaces of various descriptions, but the centrifugal ventilating machine was held in the highest repute in 1838. They sometimes employ a portable machine of the same description, capable of producing a volume of half a cubic metre per second. The first air-pump was erected in 1830 at the St. Louis Pit, Mons. The most powerful is that of l'Esperance, near Seraing, which extracts 8 cubic metres of air per second.

Mr. Dunn then enters very fully into the details given by Mr. Dickinson, Government Inspector, and refers to the statistics of Mr. Robt. Hunt, F.R.S., of the Museum of Practical Geology, which have already appeared in the *Mining Journal;* and, with regard to the proportion of fatal accidents, remarks that the fatal accidents in Belgium upon each 1000 workmen in 1850 were—In fiery mines, 7·12; and in non-fiery mines, 3·79: average, 5·4. There were 5,820,588 tons of coal raised, and 212 persons killed, equal to 1 death for every 27,125 tons raised. In Durham and Northumberland 114 persons were killed in 1854, the quantity of coal raised being 15,420,615 tons, giving only 1 death for every 135,260 tons raised, showing the mortality in Belgium to be five times the ratio of these countries, notwithstanding the Government legislation, and that the deepest collieries do not exceed 250 fms. It is to be regretted that in these statistics there are no means of ascertaining the number of hewers in each district. After stating where he considers the chief deficiency to rest, he concludes by remarking that he should recommend, as a remedy, two or more spacious shafts, a pumping-engine of from 150 to 200-horse power, also two winding engines of at least 80 or 100-horse power each, a distinct proportion of shaft being allotted to the ventilating furnace, the said shaft being lined with stone or fire-brick, the winding-shaft to be fitted with guides for cages, such cages to contain two, three, or four tubs each; the water met with in the shafts should be tubbed back with cast-iron segments; and, to provide against corrosion or decay, the said tubbing should be guarded by fire-bricks in the upcast shaft. As this description of establishment is calculated to bring the coals from great distances, the road should be laid out six feet in height, and guarded by pillars of adequate strength, proportioned to the depth from the surface, the strength of the coal, and the hardness of the floor; the ventilating furnace must be spacious, placed at a convenient distance from the shaft, and well guarded from firing the coal by arching; a separate airway or dumb-drift should also be arranged for passing any portion of the air into the shaft, which may become inflammable, without communicating with the flame of the furnace. A colliery thus fitted up, if properly supplied with coal from below, will raise from 1000 to 1200 tons of coal per day. A very necessary appendage to the above is an extensive suite of screens to separate the coals into first, second, and third qualities; it is greatly attributable to this want that the proportion of large coals in Belgium is so inconsiderable. The application of engines for hauling coals below ground is also very necessary. It is probable this exposition may induce the attention of the leading engineers; and, although these remarks may be found in many respects incorrect, and in sundry cases anticipated, Mr. Dunn hopes the effort will be regarded as a desire of arriving at the truth.

Health of Miners.—At the recent meeting of the Cornwall Polytechnic Society, Mr. Herbert Mackworth read a paper upon "Miners and Mine Ventilation," in which he stated that upon comparing copper miners, tin miners, and agricultural labourers, whose ages average 26 years 4 months, 25 years 7 months, and 34 years 2 months respectively, and the number of years worked by each, which was 27 years 3 months, 27 years 6 months, and 42 years 3 months respectively, it appeared that there was a difference of 8 years on the average duration of life, and nearly 15 in the period of work. He contended that there was no necessity for this disadvantageous condition of miners, and in proof of his assertion referred to the statement of Mr. G. Wallis, M.D., medical superintendent of Abercarne Works. Mr. Wallis does not include women and children, as they are not labourers, and considers the list contains nothing more than a detail of diseases such as that kind of population would inevitably suffer from, under ordinary or agricultural employment. There is no one single complaint which has been produced by the employment of the people in the mine. Under proper management, such as is adopted at Abercarn, no special disease of any kind ought to result from working in mines. Good ventilation is a sufficient security against the occurrence of any special disease to which miners might be supposed to be liable. The following is an entire list of the diseases which have occurred within the year:—Dyspepsia, 29; rheumatism, including lumbago, 33; fever (of which no one has died), 27; diarrhœa, 19; common cold, 8; pneumonia, 5; tubercles of the lungs, 4 (one death); accidents, 3 (no death); cough, 4; quinsey, 3; erythema, 3; disease of the heart, 2; sore throat, 2; ophthalmia, 2; tumours, 2; abscess, 1; neuralgia, 1; urticaria, 1; erysipelas, 1; carbuncle, 1; gastritis, 1; syphilis, 1; paralysis, 1; intussusception, and one death. The diseases which have affected the labourers in the deep pit, which as you know is upwards of 900 ft. deep, are 5 in number,—viz., dyspepsia, 2; fever, 1; rheumatism, 1; cough, 1. This list will prove amply that the employment of mining is as healthy an occupation as any which the working population of the country pursue. Indeed, the miner has a better chance of longevity than any artizan. The number of labourers employed in these mines is 580. The Rev. J. Punnet considered that one great cause tending to destroy the life of miners was the early age at which they go underground; little fellows, ten or twelve years of age, working 80 fms. underground, and coming up looking as if they had been dragged through pools of water. That is one of the things to which we ought to give attention, and to which the Legislature of the country ought to direct its attention, that children of that tender age should not go underground and lay the foundation of disease for the rest of their lives. He believed that if there were some enactment to prevent miners working underground until a later period, we should not have such an awful destruction of life as we have now.

Original Correspondence.

THE GREAT PHŒNIX DISTRICT.

Sir,—I noticed in your valuable Journal, a few months since, Mr. Ennor's remarks on the geological position of Great Phœnix, and its vicinity. He has also more than once made remarks on West Sharp Tor, which mine I have repeatedly inspected. He states that the Great Phœnix is a very remarkable piece of mining property, so as to induce him to state that he sees no such line of strata elsewhere in Cornwall. Now, I beg to call Mr. Ennor's attention to the patch of ground leading from Wheal Buller eastward to the Great United Mines, which is about two miles, and also to draw his attention to the tract of ground leading to St. Day, including Wheal Damsel and Ting Tang, the latter of which is situated to the foot and south extremity of Carnmarth Hill; also Wheal Mead, Wheal Fortune, Wheal Comford, and the Treviskey Mines. Those mines, not forgetting the Tresavean, extend about three miles from west to east, while I may end with the mineral-bearing ground as far east as Nanjiles: a large elvan dyke crosses the vicinity of those mines. I will go no further than the ground I am acquainted with,—that from the turnpike-road leading from Comford to Redruth eastward. Now, I think from the turnpike to Gwennap Consols to a shaft called Elvan shaft, which is sunk in about the centre of this mine, is about two miles, and thence to a shaft called Davies' shaft, leading eastward towards Wheal Fortune, which is about ¼ mile further, this great elvan is again visible. About 30 years ago I was a tributer in the 90 fm. level at Davies', when I recollect having a tribute pitch in the elvan shaft. This elvan sends its shoots southward into the Great United Mines, a ½ mile south, and parallel with the same lodes. It was always considered by the old tributers in the Great United Mines, that if they could discover a small elvan vein that crossed their lodes they were almost certain of success; in fact, I myself, when a boy about 11 years of age, was employed with two tributers, who would always endeavour to take their pitches near those elvan veins, and I believe they were the most fortunate tributers in the mine.

I recollect a gentleman, by the name of Cardozo, who was then the proprietor, made a remark to some of the men, that the great deposit of mineral would be found eastward, and it was the first time that ever I heard those elvan dykes discussed on, and from that moment I never lost sight of Mr. Cardozo's comments. Whether that gentleman is now living or not I cannot say, but never could any person have predicted more correctly. This large elvan, which appears to spring off westward from the granite, leads as far down as Carnon Streams, at which point it appears to be split in different branches. About four years since, when I was in that district, I spent a whole day in tracing the cuttings of the roads, quarries, &c., in search of the shoots of this subterraneous champion. If I mistake not, I have in my possession the different shoots, 26 in number, all of which resemble the roots of trees, springing off in different branches, and dwindling into fibres. I cannot see the least symptoms of those shoots to the east of Truro, neither can they be seen a mile to the west of Truro. Now, if Mr. Ennor would compare these districts, and would give himself the trouble to look minutely into the formation of the stratified rock lying on the granite east of the Great Sharp Tor, including Great Phœnix, the two Caradons, Marke Valley, and as far east as Holmbush, taking in a whole tract of ground as far as Five Lanes; and I may still go further north, and include Great Rough Tor, and the mineral-bearing ground south of Camelford, and as far east as the parish of Davidstow, but I will leave this latter district until I have explained my reasons why Mr. Ennor called the Great Phœnix district a singular formation. Mr. Ennor, I have no doubt, in his tour through the country, had no time to look into the different causes which lead to rich mineral deposits in this district, but if he would minutely examine the stratified rock in the neighbourhood of Great Phœnix, and then compare the Gwennap district, beginning from Redruth to Carnon, about four miles from Truro, he would discover very similar formations.

Now, at the foot of Caradon, northward, at a mine called Wheal Jenkin, at the south extremity of South Phœnix, there is an adit driven for many fathoms through a decomposed elvan, with about 5 or 6 fms. of micaceous slate lying on it. This slate deepens eastward, towards Dunsley Wheal Phœnix and Great Phœnix. In Great Phœnix, the micaceous slate is from 8 to 10 fathoms deep. It is many years since I worked in the present engine-shaft, at the commencement, but if I mistake not we sunk through 5 or 6 fathoms of decomposed trap, much traversed with decomposed granite, and I believe in the 10 fm. level we put out a cross-cut north and intersected the lode. I recollect working in this cross-cut, and cutting through the capels of the lode, for which we had 90*l.* per fm.; we bored into a solid branch of grey copper ore, from which I broke and dressed 1½ ton. The mine, then in the hands of Capt. Larkings, was much involved, and the dues were in the possession of Messrs. Williams, who had about five years lease unexpired, from the Duchy of Cornwall. It was abandoned, and some four or five years elapsed, when South Caradon was found rich. The present Mr. Cross, of Great Phœnix, applied for the sett from the Duchy, notwithstanding receiving several unfavourable reports from different agents, who doubted whether the great gossan lode, which was called or termed "ironmould," would ever produce copper. Mr. Cross (I was informed) was for some time hesitating whether it was prudent to remove an engine that he had on a tin mine, for the purpose of exploring the Great Phœnix. At that time I was a tributer working at the Callington Mines, when Mr. Cross sent for me: he kindly asked me whether I had ever broken and dressed any copper ore from the 10 fm. level, and my opinion of the mine as to its producing copper in depth. I told him I considered the nature of the lode very congenial for copper, and that I had broken 1¼ ton of grey copper ore in the bottom of the 10 fm. level. He told me that some did not consider the gossan to be congenial; but, notwithstanding, he had made up his mind to remove the engine, and to explore the mine at a deeper point. I told him I considered it useless to extend levels at shallow points, but if he would make up his mind to sink under the first formation of gossan, I believe he would discover a rich course of ore: 16 or 17 years elapsed before I saw that gentleman again, when it was on the mine, taking a view of the floors, almost full of rich copper ore. This mine, like those in the district of Gwennap, is surrounded by elvan dykes, and when sunk at a reasonable depth became a profitable investment.

Dunsley Wheal Phœnix is situate between Marke Valley and Great Phœnix, and I do not scruple in saying that the lodes in Dunsley have a similar formation to those of Great Phœnix. Several hundreds of pounds worth of tin has been raised from the backs, not more than 7 or 8 fms. deep, all of which lodes will produce copper at a deeper point, similar to that of Great Phœnix. The Marke Valley lodes are north underlayers, and must dip into the Dunsley sett at a deeper point; and it is only a pity that there is not a steam-engine erected, and the shaft sunk to the intersection of those lodes. I intend shortly, by your permission, to publish a diagram of those mines, showing the depth of micaceous slate overlapping the granite and the copper-bearing district, and although the task may be somewhat difficult, yet I am positive it would throw a great light on the subject. I do not intend to assert that I have found out anything in Nature's laws to introduce mining as a sure investment. I wish particularly to guard against this most erroneous idea. I again say that mining can only be called a speculation, even by the best of judges, and in the best localities; of course, there are mines, or rather lodes, opened in certain districts, which have no chance of being successful. These can be easily detected by thinking and practical men. On the other hand, there are lodes opened in some districts that can bear the scrutinising inspection of Practicals, who, judging from analogy, would call them worthy the attention of capitalists. Still, no man would be justified in calling it a sure investment. I am aware that no honest man, who has got his living from his youth in the bowels of the earth, would presume to call the most promising lode that was ever opened in Cornwall a sure investment until he finds the mineral; and until then he can only judge from the changes that take place from level to level.

But the great evil in mining has not been half explained to the public. Why do we hear of so many mines being abandoned? It is simply this: the "bal sellers" are not always practical men; they take up a sett, put down a few shode-pits, and open on a small fissure or branch—a mere vein passing through the country—which sometimes forms a wall, similar to a well-defined lode. They break a little gossan, but oftener fuller's earth: the mine is then named Wheal something. They take their little box of specimens, and off they start; and in a week or two we see the mine, or a substitute for a mine, brought out into a great number of shares; and before there is 10*l.* spent on the mine it is quoted at 1*l.* per share paid—perhaps the mine never seen by the purchasers. A steam-engine is ordered, a shaft commenced sinking before any adventurer visits the mine: and after some months, finding the calls becoming rather heavy, an inspecting captain is called in, when too late. The bubble then bursts into airy nothingness; the parties being so disgusted they give up all thoughts of mining, as if every part of Cornwall was made up of the same materials. But is there not a method of preventing this? I am sure, Mr. Editor, that you will not blame me for making the following remarks:—Would it not be more practical, when a young mine is opened merely by shode-pits, to call in, not one, but two, three, or four practical and experienced men, who understand the nature of a copper, tin, or lead lode? Surely the majority of this number ought to be the best guide: and I say thousands of pounds would be saved in mining if this plan were carried out; on the other hand, there are lodes opened well worthy the attention of capitalists, but too frequently are those mines abandoned, with loss of capital, taken up again by other parties, and very soon become rich mines. Indeed, there are but few of the richest mines in Cornwall but what have been abandoned, through a system that I hope will soon be abolished—that is, driving long adits and shallow levels.

Holmbush Mine, which is but a short distance from my house, has been abandoned twice to my knowledge, with a loss of capital. It is an old saying, and a very true one—"It was the last straw that broke the camel's back." At the commencement of this mine they expended a large capital in driving shallow levels, and a stone of ore occasionally so enchanted them, as to induce them to think they were going to discover masses of copper near the fern roots. This system is the ruin of many mines; when, at the same time, had they confined their operations to sinking their shaft, Capt. Malachi nor Mr. Hitchins would never have had to reap the benefit of the first outlay. Common sense must tell us that if a mine be not found rich at a reasonable depth, the shallow levels, with a stone of ore in the lode occasionally, will avail them nothing. I might mention many other mines in the West of Cornwall, that are now rich mines, which have been abandoned, with a loss of capital, by carrying out the system of driving shallow levels.

Now, in reference to West Sharp Tor: it has parallel lodes with the Great Phœnix, about half a mile from the north-west extremity of the run of their lode. To the south-west lies Cheesewring, and on the north, Sharp Tor; consequently, the mine is between the two hills. The lode is large, and in some places from 20 to 30 ft. wide; in the 70 there is a branch of grey copper ore of a very excellent quality, similar to that of Great Phœnix, which I broke in the 10 when I first cut into the lode—very much impregnated with iron. There is a large elvan dyke running parallel with this large lode, which causes their sinking to be very expensive. To the east there is a patch of micaceous slate, overlapping the elvan. The back of the lode produces large masses of very strong gossan, which every miner would consider worthy of a spirited outlay; but as no one can see through the bowels of the earth what they might meet with in sinking, they turned their attention more to the western part than they might have done had they been aware of such a large elvan. The last time I visited the mine the elvan had become smaller in the bottom of the mine, and the lode more compact; and should the dip of granite to the south cut off the runs of elvan, and master the dip of rock lying to the north, there cannot be a doubt but West Sharp Tor, at a deeper point, will prove equivalent to her rich neighbour. According to my views, the deposit of ore will be found deep, as the two strata of ground, or rather the dip of the granite rocks, together with the elvan passing between them, will form a junction somewhere about the present depth; and the lode being a south underlayer, will cause the mine to be sunk deep into the southern hill before the lode can be expected to be in the position of the surrounding properties. It will then become smaller and more compact. This great lode has a similar character to that of Great Phœnix, but has been hitherto in a disordered state by the elvan that is running in the valley, and can be traced for miles eastward; and, as I stated in a former letter, that where elvans are found in the vicinity of lodes, whether the lodes pass through granite or stratified rock, there is every probability of some rich deposits of ore. I would now call the attention of those who profess to know the mineral-bearing rock to the parishes of Cardinham, Warlegin, and more particularly to Blisland; and if they will give themselves the trouble, after visiting those parishes, and minutely examining the different elvans and the angle they take, also the nature of the numerous lodes that pass through them, to take a journey a few miles to the west of Truro, in the parishes of Gwennap, Camborne, Kea, and St. Agnes, I think they will see a great similarity; and it is my impression that there is a day coming when steam-engines will be in motion in this long-neglected district. I mentioned the Great Rough Tor, which, although at present poor, and may not (at the point they are working) turn out productive, still I have every reason to believe that on the line of the same lode, and even in the sett, there will be rich deposits of ore discovered. It is not always the case that deposits of ore are found under a rich gossan; this appears to me to depend on the depth of strata. Copper, which is the cause of the gossan, may be some 50 or 100 fms. east or west, and the formation of the gossan frequently depends on the open fissures, or crevices, it has to struggle through, like the flue of a chimney, when the fire might be at a great distance from the current of smoke.

John Sparoo.

Downgate, Cornwall.

TRIAL OF PATENT CAUSES.

Sir,—In my letter of last week, I promised to draw attention to particular points in the present system of trying patent questions, on which it will be useful to collect practical illustrations of defects inherent in such system. And my object is not merely to convince your readers that there are these inherent defects (this is not necessary), but to lead them to realise more fully what is the extent of their mischievous effect on patent property, in order that they be induced to co-operate with others in an effort to remove at least some of the existing defects. For the sake of convenience, I will refer to the four following points:—

1. Cases in which Patentees have felt themselves obliged to give up all thought of defending their Patent Right against Infringers.—Patentees know full well that as soon as it becomes generally understood that they are not in a position to proceed against an infringer, their patent is practically at an end. Now, there are many patentees in this situation who are by no means needy men; they have capital enough to work a moderate business, and are capable of meeting the ordinary contingencies incidental to the scale of operations in which they have embarked. But the defence of their patent right, by bringing an action against an infringer, is far too costly to be for a moment thought of by them as prudent men. The artificial mode of attack which the present system tolerates renders it necessary to employ a most costly means of defence, or defeat is certain; and even when the greatest efforts are made, and the greatest expenses incurred, the uncertainty of the result is so great as to deter all but the wealthy and (it may be over) sanguine patentees to enter upon a contest. It is to be remembered that no verdict can be obtained until the whole expense of a trial has been incurred, and then, should it be favourable to the patentee, the complications that have been introduced or imported into the cause during the course of its trial are sure to leave a sufficient number of points open or unsettled, according to ordinarily accepted legal rules, to call for a new trial; and so it may happen that the proceedings come to be indefinitely prolonged. I think, then, it would be extremely valuable if some of your readers would communicate the particulars of the costs of such proceedings as they may chance to be well acquainted with. This is distinctly a matter calling for accurate figures, and a true statement of facts in other respects, and it will only be prejudiced by any exaggeration or false inference, so that the testimony should be, if possible, first-hand, but, at any rate, unimpeachable.

2. Cases in which Patents have been unjustly dealt with by Scientific Witnesses.—Very strong things are said on this point, but what amount of truth do they contain? The question, however, is, Does the present system place scientific witnesses, who are called to oppose the patent, in a position which is naturally calculated to lead them to exaggerate the defects in the patentee's case? Does their position lead them to over-refine upon the points of objection taken to the patent? Without dealing in any imputations upon individuals, is it quite right to submit to the test of rigorous investigation the principle of trying patents, by allowing practised witnesses to take objections to them in open court, founded on scientific opinions of a recondite nature, under no other control than that which is supplied by the requisite notice of objections? The judge who allows the objection to stand in the list has no means of knowing, perhaps, anything of its birth and parentage, nor of the ingenious manner in which it is likely to be expanded to the dimensions required for the case that it is intended to support. I can also readily conceive of instances in which scientific witnesses themselves would have had but little idea, in the early stages of a cause, of the degress of bias eventually imparted to their minds by the sustained effort to see their case in the most favourable light; and here we must bear in mind that a scientific witness accepts employment, on the understanding that his utmost skill is to be exerted on behalf of his client, to protect him from any undue effect of similar testimony on the opposite side, so that in the circumstances in which he is placed the very sense of duty is liable to warp his understanding for the time at least, and to deepen the colour of his evidence. The force of this tendency of the position of an advocate, to lead him to take a one-sided view of a case, is often commented on by judges, in order to prevent juries from being too much influenced by them; and a judge is capable of checking this evil, because his mind naturally reverts to his own experience. But where is the adequate check in the case of the scientific witness? The point, then, to which I am anxious to draw attention is, that the peculiar position of the scientific witness naturally leads him to make unqualified statements in the heat of the conflict which are injurious to patents, and that the system which calls him into this position is so far defective. I would suggest, therefore, that well-authenticated instances of over-refined objections to patents should be communicated for the information of your readers.

3. Cases in which the Courts seem to have been perplexed by the conflicting nature of the Scientific Evidence.—The legal theory is that the scientific evidence called on the one side is balanced by that called by the other side; but the inference to be drawn from the frequent remarks of the judges on this point is, that the evidence on the one side is too often held to neutralise that on the other side. I am not speaking of evidence as to facts, but as to scientific ideas. There is not so much difficulty as to facts, because they are testified by another class of witnesses, who can be more completely managed by counsel in their cross-examination. However entertaining it may be to indifferent spectators, it is anything but agreeable to the parties who have to bear the costs of the action to hear a judge remark on the perplexity arising from the conflicting nature of the scientific evidence, which, for such reason, he quietly ignores in his summing up, lest any attempt on his part to unravel the difficulties should only increase the puzzle for the jury. I think, therefore, it would be useful if some of your readers would communicate distinct information as to actual occurrences of this kind within their own experience.

4. Cases in which the Jury have been puzzled by the Scientific Evidence.—Patents are usually tried before special juries, and, therefore, the class of men to whom the points are referred are generally men of good plain education, who are possessed of some knowledge of the world, with good habits of business. Such men can form a judgment on matters of fact, but conflicting allegations of science are quite out of their way, so that they must either take them upon trust, or leave them out of consideration; and yet these scientific contentions have been carried on in their presence, in order to produce an effect on their mind, and give the wished-for direction to their verdict. A conscientious juryman would, therefore, feel it to be an important part of his duty to give all the consideration in his power to the scientific evidence of opinion, being as it is so inextricably mixed up with the facts in the cause. Now, I should recommend such of your readers as have served on special juries for the trial of patent causes to state their experience of the effect produced on their minds by having to listen to scientific contentions, as involving part of the case on which they were ultimately to give their verdict.

I trust the above appeal will be responded to by your readers in such a manner as to lead to a fuller appreciation of the defects of the present system.

Office for Patents, 50, Chancery-lane, Oct. 8. William Spence.

LUNAR MOTION.

Sir,—From the earliest times mankind have been taught by the learned astronomers of every nation, that the moon was subject to a double motion—that is, that its centre revolved nearly in a circular orbit about the earth in the space of 27 days 7 hours and 43 minutes, and in the same time twirled like a tectotum about an axis passing through its centre, and nearly pendicular to the plane of its orbit. This latter motion appears to have been inferred from the observed fact, that the moon, while it revolves in its orbit, constantly presents the same face towards the centre of the earth, so that no man living on the earth can by any possible means see the back of the moon. A few months ago a letter was communicated to the *Times* by Jelinger C. Symons, Esq., B.A., one of Her Majesty's Inspectors of Schools, in which he firmly denies the existence of this double motion of the moon. This letter really implies that the schoolmasters, professors, and astronomers of Europe, have been teaching the public a great error, or, putting it in a milder form, they have been arrogating to themselves the exclusive privilege of teaching the people what is not adapted to their comprehension, or understood by them. Of course, a letter which denies in toto the truths of astronomy that have been taught for ages, written by an educated gentleman, holding a responsible situation under the Crown in connection with education, was sure to command a good share of public attention, and also to stimulate a good deal of irritating discussion, and, therefore, the *Times* was inundated with replies from various quarters, some approving, others ridiculing, a mode of procedure which to my mind is highly reprehensible as being unsuitable for philosophical discussion, and a few popular writers on science, while denying the validity of Mr. Symons's position, still think the ordinary interpretation of the moon's motion is unnecessarily difficult, and unsuitable to the comprehension of children at school. As the discussion advanced and assumed larger dimensions, by including in its folds intellects of every calibre, it seemed desirable to move it from the columns of the newspaper, the arena of political and social conflict, into a calmer atmosphere of philosophical research. This has been done by Mr. Symons himself, who has collected, with skill and labour, the substance of the arguments and objections which have appeared in the *Times* and the various periodicals, and published them, with his own remarks, together with the letters of the Astronomer Royal, in a pamphlet entitled the *Lunar Motion*, "the whole argument stated and illustrated by diagrams," &c.

It is to the contents of this pamphlet I shall address a few observations, and if I cannot always subscribe to the views of Mr. Symons, I hope to state in a proper spirit the circumstances which divide us in opinion, and also to add my humble testimony to the great good which the discussion of the moon's motion has effected in the cause of education. Mr. Symons need not regret re-opening the discussion of this subject, and I am sure that no one who has read with attention his letters and pamphlet will deny him the privilege of fully comprehending the stereotyped explanation of the moon's motion, and the difficulties which it presents to a youth studying for the first time the elements of astronomy.

The contents of this pamphlet are divided into two parts,—viz., the quotations from celebrated authors, and answers to the less scientific opponents; and, secondly, the two remarkably clear letters of the Astronomer Royal, with Mr. Symons's views and comments, and quotations from Mr. Perigal, and the scientific author of the Edinburgh Essay of the "Astronomical Doctrine of the Moon's Motion." In the commencement Mr. Symons distinctly and candidly states the views of La Place, Woodhouse, Nichol, Poisson, Hind, and Lardner, with respect to this subject, and he exhibits the rare moral courage in doubting the correctness of the teaching of these great authorities. In this respect I am certain that all liberal thinkers will applaud his conduct in not allowing the dictum of great names to influence improperly the decisions which his own reflections have induced and matured. The justly celebrated authors above referred to would never demand such homage from their admirers and readers, as they would be the last men in the world to concede to their predecessors the right of private judgment in matters appertaining to the development of science. Their discoveries are a living testimony to their unwillingness to yield a single point which they had not thought out for themselves.

In page 6 Mr. Symons has very correctly and simply represented the moon's motion about the earth by means of a diagram, which is the same in effect as fixing an orange on the rim of a coach-wheel turning round on its axis, as the same face of the orange will always be turned towards the boss, or centre of the wheel. The orange in this case represents the moon, while the boss of the wheel represents the earth. Then

this nothing can be more simple or effective, and I feel confident that every teacher will be neglecting an important part of his duty if he does not immediately adopt this method of explaining the moon's motion. In this simple illustration, which all parties acknowledge to be correct, the opponents of Mr. Symons attribute to the orange an axil motion, like a tectotum, while he as firmly denies its existence. This is the whole gist of the question at issue, and the battle-field on which the great controversy must take place that decides the axil or non-axil rotation of the moon. Mr. Symons states, "arrest the earth in its revolution round the sun, and it will still rotate on its axis, for it has an axil rotation. Arrest the moon in her revolution round the earth, and she will be motionless, because she has no axil rotation." Here I must be guided by the results of my own reflections, and although I perfectly coincide with the views of Mr. Symons and Mr. Evan Hopkins, with respect to the orange being a correct interpretation of the moon's motion in her revolution round the earth, still I cannot at present see the force of these statements or their objections, except in appearance, to the axil motion of the orange or the moon.

To any one who performs the experiment of the orange fixed on a revolving wheel, it does appear to the eye to have only one motion of revolution round the axis of the wheel, and still the same side of the orange is presented to the centre of the wheel. This position cannot be impugned successfully. Astronomy and motion, however, ought to be the last subjects in which inferences should be made from appearances. The moon appears to the eye to be a flat disk—it is a globe; the sun, moon, and stars appear to describe circles round the earth, is it so? We appear to be at rest on the surface of the earth but are moving through space at a fearful speed. These, and a number of other phenomena, show, at least, that great circumspection is necessary to make correct inferences from the sense of sight. And I must confess my decided conviction is, notwithstanding the appearance of the orange, that it has an axil rotation, and the only question which remains is, to show it, not by mathematical symbols, the evidence of which, though strictly correct, is not recognised by the great mass of the people, but palpably to the senses, by means of mechanism. This task is by no means impossible.

There are some points on this subject in Mr. Mushet's letter on Mathematicians, published in your Journal of Aug. 23, which deserve grave consideration; but I cannot follow him in his vain attempt to damage the fair fame of the calculus, because it yields in the hands of schoolmen covered with purple and fine linen "sophistries" and other fungi which flourish on the banks of learned academies and universities. I have as great a horror as Mr. Mushet or any other gentleman of the conceitedness and puerilities of those who have studied geometry through the medium of the calculus, instead of the calculus through the medium of geometry; but I must contend that, as a discipline of the mind, and useful applications in the development of physical and engineering science, mathematics has no rival to compete with.

Coal Miner.

Meetings of Public Companies.

CWM EIGIA QUARRY SLATE AND SLAB COMPANY.

The general meeting of proprietors was held at the London Tavern, Bishopsgate, on Thursday, Sir E. Pearson in the chair.

Mr. W. F. Nokes, jun. (the secretary) read the notice convening the meeting, and the report of the directors, from which the following is condensed:—Since the last general meeting the call of 5s. per share, then authorised, has been duly paid on the 2255 shares taken up at that date, with the exception of 255. The committee of management have acted upon the power vested in them of adding to their number, and the remainder of the 12,000 paying shares have thus been all issued, and paid upon to the extent of 10s. per share, with the exception of 525 shares. In the month of December the committee caused a survey to be made of the company's quarry, by Mr. T. Jordan, whose experience and judgment, both in engineering and quarrying, were well recognised and attested. Mr. Jordan furnished a very comprehensive report, together with drawings, estimates, valuable suggestions, and advice for the future working of the quarry. This report was of a very encouraging nature, and decided the committee to prosecute the works with vigour, and to secure the most competent management for the company's operations. In the month of March, they accordingly effected an arrangement with Mr. Jordan, under which he undertook the practical superintendence of the works, at a scale of remuneration to be governed (as from the month of September last) by the produce of the quarry. For the account of works completed and in progress at the quarry, the committee refer to the report of Mr. Jordan, which may be seen at the offices. Although the period at which the quarry was originally estimated to yield returns had been already considerably surpassed, owing in a great measure to the want of adequate funds, the progress made during the past six months has been such as to promise that the regular supply and sale of slates will not now be long delayed, whilst the favourable prices and steady demand justify the belief that the rate of profits will fully bear out the expectations originally entertained. The three items of building and permanent works, machinery, and labour in opening the quarry, are necessarily large, but the results are fully commensurate. The expenses connected with the management of the company are, as will be perceived, unusually small, the utmost economy having been uniformly exercised, and no unnecessary expenditure incurred. No further expense had been incurred on the lead mine, which is left in abeyance until after the slate quarry shall be in a paying state.

Mr. Nokes then read the following report from Mr. Jordan:—

In presenting my first report to the proprietors of this property, it is requisite that I should give some account of it as it was when I came into office, and I have great pleasure in being able to say that the favourable opinion I then expressed has been continually strengthened by experience. When I entered on my duties I found that I had a most promising property to deal with, on which a large amount had already been usefully expended in uncovering and opening the rock, and in erecting works which were all requisite to success; yet that much more had to be done, both in the quarry and the works, before a profitable make of slate could be anticipated. I reported to the directors to this effect, and was honoured by their commission to carry out my own suggestions. The Cwm Eigia Quarry consists at present of five different levels, or steps, in the side of the mountain, the rise of each step being about 14 yards. The lowest of these is called the mill level; it was commenced in 1855, for the purpose of securing a railway communication between the quarry and the mill, which is on the opposite side of the river, and also with a view to future workings in the rock at a lower level than the original floor. Next above this is the floor level, that at which the quarry was commenced, and to which the quarrying is continued. The workings in this level are the most important at present; the greatest length of its floor from east to west is 70 ft., and its walls on all sides exhibit masses of good slate rock, 14 yards high. The level next above this is called No. 1, being 14 feet above the floor; its walls expose many thousand yards of slate rock, only awaiting the completion of the opening operations now in progress to bring it into course of manufacture. No. 2 level is also well opened, and will be equally productive. In No. 3 the top soil has been removed, and the rock uncovered, and seems to be of good quality. There are also abundant indications far above this of good slate-making rock, cropping out on the mountain sides. The five levels above referred to occupy a vertical height of 70 feet, and the greatest distance driven into the rock from the original surface of the mountain is now 200 ft. The length from the east to the west tip on the highest level, measured in a straight line over the quarry, is 450 feet. The total length of railway throughout the quarry is now above 3000 ft.; the trucks employed on these rails were few, of inferior construction, and sadly out of repair, but eight others have been constructed, and are still engaged in building them, to keep up the supply as new occasion may arise. The manufacturing plant of the company is situated on the north side of the river, opposite the quarry: in March last, it consisted of a water-wheel, 30-ft. diam. 4-ft. breast; a saw, intended for sawing the blocks of slate; a great length of shafting and gear to transmit the power of wheel through the mill; two saw benches, a smith's shop, carpenter's shop, and stabling for three horses; there was also stabling for four horses at the company's lodge on the road to the port; and barracks at the quarry, fitted for the accommodation of 27 men, for which each man pays 1s. per month. These, with a stock of slates worth 200l., two carts and three horses, formed the property of the company entrusted to my charge on March 17, 1856, since which the following works have been executed:—In the floor level a drift has been worked into the rock in the south-east wall, for the purpose of forming a loose end, from which to work the rock on each side of it. More than 950 cubic yards have been removed from this opening, which is now completed, the cost of labour having been 110l. A large amount of good blocks have been saved, which, when made into slates, will go far towards defraying the cost of this work. From the south-west wall of the floor 299 yards of rock have been removed, yielding a good average of slate-making rock, now in course of manufacture. Outside the quarry, in this level, about 1900 yards of top ground and waste rock have been removed, tending to gain valuable rock both before and under it. A weigh-bridge and house have been erected here, for the purpose of introducing the better method of paying by the ton instead of by the day or yard. In the mill level the driving towards the rock has been extended 70 yards, and the embankment 93 yards; this embankment is now completed, and ready to receive the permanent rails; it will be finished for traffic next week, and will greatly add to economising the cost of transit from the quarry to the mill, and in increasing the value of slate. On the tracing accompanying this report, which is a part of my survey of the company's property now in progress, the six months' work on the different levels is coloured red. In No. 1 level above the floor, and in the half galleries between this and the floor, on both sides of the quarry, a great quantity of top ground and rock has been removed, as shown in the plan, amounting altogether to about 12,000 cubic yards. This work has uncovered a great mass of good rock, which will be ready to supply blocks when machinery as soon as it can be got ready. A weigh-bridge and house is in course of erection in this level. In No. 2 level the work of uncovering has also been carried on to a smaller extent; this level, and the one above it, are not shown on the plan, except by the tips of their waste heaps, because the survey of them is not yet completed. In this level sand saws have been introduced, to supersede the notched saws originally contracted, they having been found incapable of dividing the blocks with economy. Only one order of the sand saws are now at work, but two others are in course of construction. The performance is so satisfactory that more than double the number of slates are made by the same men in a given time. The proportion of the largest sizes is greatly increased, and the men say they can make as much slate out of one truck load of blocks as they could before out of six. The two saws have been working for three months, and the requisite cranes for moving the blocks, which cannot be erected in the present building. Prior to their employment our stock of slates was worth 235l., and since we commenced working we have made 62,700 slates, worth 240l., so that our stock is now worth 475l. We have sold about 15l. worth of slates.

To avoid loss of power and other inconveniences attendant on a great length of shafting weakly supported, I have decided on erecting a new mill, and appropriating the present building to other uses; this will enable us to drive a much greater number of saws with our present wheel than would have been possible with the old arrangement of shafting, and the cost of the new building will not much exceed what would have been requisite for the shops and storehouse into which the old building will be converted. With favourable weather, I hope to get the new mill ready for work in November. I have provided room for six pairs of saws—three of which will be ready before the building. The quarry will be able, in the spring, to supply the 12 saws with blocks enough to secure a make of 20 tons per day, provided the proper number of men are employed: at present we shall then be in a position to say that our make depends more on the number of men and the machinery employed than it does on the power of the quarry to supply blocks, for that will, in all probability, exceed our power of manufacture; and I feel satisfied that we have only to increase this power as it is required, and to keep the head well supplied from the different levels, in order to secure any reasonable amount of make which the directors may decide upon.

No attempt has yet been made to obtain orders, because our stock of any one kind has not yet been sufficient to ship, but we may now begin to sell to small purchasers; and with respect as to prices and terms are constantly being made. The few that we have sold in the immediate neighbourhood have given great satisfaction, so that there can be no want of a sufficient demand. I estimate the average cost of production at 21s. per ton, and the average selling price, of all sizes and qualities, at about 38s. per ton.

The conveyance to the port is not yet provided, for I have purposely delayed the purchase of horses beyond what is absolutely requisite for present use, to avoid the cost of keeping them through the winter, when comparatively little hauling can be done. We now have four good horses and two carts, and a new stable has been built at the lodge for six horses, making altogether fourteen stalls. The road from the quarry has been repaired, so far as the company's right extends, and one man constantly employed on it will be able to keep it in good order. There is some probability of a railway between Conway and Llanrwst, which promises to facilitate our conveyance, and may afford reasons for changing our port of shipment. It will not, therefore, be advisable to take the Tal-y-Cafn Wharf for a term, or to make much outlay in fitting it up for our purpose.

A statement of accounts was exhibited from the formation of the company to Oct. 5:

Calls received, and cash of workmen for rent	£5680	13	0
Buildings, machinery, labour, materials, and general expenditure	5218	15	8½
Cash balance in favour of company	£ 461	17	3½

And in the estimated accounts of assets and liabilities the balance in favour of the company was 855l. 17s. 10½d.

The Chairman said he believed that, after having heard the report of the manager, every one would consider that their position was most satisfactory. It would be impossible for him to add to that report, but he would endeavour to fill up any gaps in that document. He (the Chairman) had been down to the quarry last week, in order that upon the present occasion he might tell them what the prospects of the undertaking were. Those gentlemen who had been proprietors in the company from the commencement would well remember the difficulties in which they had been placed. The works were carried on the first year most judiciously, and for which they were indebted to the able management of Mr. Leonard. It would be remembered that in the autumn of last year they endeavoured to raise additional capital amongst the existing shareholders, but did not succeed, and the undertaking was in danger of being altogether lost, through not a single one of the original proprietors agreeing to advance any more money. He (the Chairman) then applied to his own private friends, and succeeded in inducing a number to join, by which means they obtained the money required. Mr. Jordan had been appointed manager in the beginning of the year, and had been highly recommended by the Messrs. Taylor; he also had a very high character in the neighbourhood for integrity, ability, and perseverance. Mr. Jordan, upon being appointed, was so pleased with the appearance of the quarry that he agreed to work the first six months at a salary, and after that time at a royalty. When he (the Chairman) went down last week to inspect the property, he found the quantity of rock there quite unlimited; and with respect to the quality of the slate, it had been tested against the Penrhyn slate, which had been considered the best in the world. However, the slate from the Cwm Eigia Quarry had been found tougher, and did not absorb the water so much as the Penrhyn; but it was only fair to state that at present it had one defect, being spotted with pyrites. Although this did not impair the value for roofs, as some in the neighbourhood had stood for twenty years, and was now as sound as ever, it was a blemish in slabs. It was the opinion in the neighbourhood that in depth the mundic would disappear, as that had been the case in other quarries in the locality. When the alteration was made in the saws, three or four tons of slate could be made a day, and the average price it would fetch would be about 2l. per ton, and the make about 1½ tons. He believed the profit from their slates would be greater than in any other quarry, owing to the very great facility for getting rid of the waste. It might be asked why they had not sold slates, and the reason was because they had not made sufficient for a cargo, but in a short time, from information received, he believed they would be able to command the market. He concluded by moving that the report and cash account be adopted.

The resolution was then seconded, and unanimously adopted. Three of the directors having gone out by rotation, the following gentlemen remain on the committee:—Sir Edwin Pearson, Messrs. T. E. Dicey, W. H. Dickson, A. Jenkinson, J. S. Orton, Sir W. Gore Ouseley, K.C.B., Messrs. B. Price and G. F. Young.—The proceedings of the general meeting having terminated,

Mr. Nokes, sen., in proposing a vote of thanks to the Chairman, said they were very deeply indebted to him for the very great exertion he had made in saving what he considered one of the finest properties in existence. It was found that the pyrites was in the slates at the top of every mountain in the district, but he had no doubt when they got further down the iron would disappear. The fact of the slate not absorbing water confirmed the truth of the statements made at the commencement of the company. The trouble which Sir Edwin Pearson had taken had established the company, and everything now was progressing most satisfactorily, and to his (Mr. Nokes's) mind, it only required money and time to make it a most profitable undertaking. He would conclude by moving that the best thanks of the shareholders be given to the Chairman.

Mr. Payne seconded the resolution, which was unanimously carried, and acknowledged by the Chairman.

The meeting was then made special, for the purpose of deciding upon the forfeiture of 255 shares for default in payment of the second instalment of call due Feb., 1855, and also to consider the propriety of bringing the company under the Joint-Stock Act, 1856, with limited liability. Resolutions in accordance with these suggestions were unanimously adopted, and the proceedings terminated.

UN-LIMITED LIABILITY—JOINT-STOCK COMPANIES ACT.

[FROM A CORRESPONDENT.]

In our last Journal we gave some instructions as to the method of bringing a Welsh "cost-book" mine under the new Act with limited liability, and, as a ready and simple example, selected the Pen-y-Gelli Mine, but without any intention of otherwise particularising that mine. We will now endeavour to trace the necessary steps for registering a similar company with *un*-limited liability. As such cost-book companies at present enjoy *un*-limited liability to the full extent of the word, it may be asked why, supposing they can legally continue to exist after Nov. 3, they should incur the expense and trouble of registering under the Joint-Stock Companies Act, 1856? The question is very easily answered, and satisfactory proof can, undoubtedly, be adduced of the immense advantages to be derived by registering, even with *un*-limited liability. It is notorious that under the existing system creditors fall back either upon those shareholders most competent to pay, or upon those least difficult to bring into court, whilst those residing in distant parts of the kingdom, or who are extremely unwilling to part with their cash without giving the creditor the greatest possible trouble, regardless of annoyance to themselves, escape comparatively easy. By registering under the new Act, the position of the shareholders would be materially improved, as they would have every benefit conferred by the Cost-book System without its many defects. The company becomes, by registration, a corporate body, and thus creditors are prevented from annoying individual shareholders, yet the creditors have an equally good opportunity of obtaining their money. The company is in no way fettered by the Act, yet those in power are compelled to make such returns to the shareholders, the shareholders only, as will effectually protect them from imposition. It would, therefore, appear that, even allowing the legality of unregistered companies, no one would think of advising the shareholders not to register, unless it were, perhaps, the uncontrolable secretaries and rapacious directors of mining companies as at present conducted. By the general adoption of the new Act, mining would be elevated from its present position to that which it ought to occupy, and the public would gain confidence, and feel comparatively secure from the danger which too frequently threatens them, thus bringing mining into fair repute as a means of legitimate investment.

We will take the Willow Bank, a lead mine in Cardiganshire, professedly on the Cost-book System, and pursue a similar course to that adopted with respect to the Pen-y-Gelli in our last Journal—assuming, however, that the shareholders are desirous that their liability should continue *un*-limited. We must also provide a share of a marketable amount, and provide some little capital to carry on future operations. A meeting must be called, as before:—

Willow Bank Lead Mining Company.—Notice is hereby given that a special general meeting of shareholders will be held at the offices of the company, 17, Bishopsgate-street Within, on Tuesday, Oct. 28, for the purpose of considering and deciding whether, in registering the company under the Joint-Stock Companies Act, 1856, it shall be with or without limited liability. By order, Ignis Fatuus, Sec.

London, Oct. 9, 1856.

It being considered desirable to register without limited liability, the series of resolutions may be passed in the following form, or similar in effect. These will create 2l. shares, which are neither too high nor too low to be readily negociable, whilst by changing the constitution of the company from a cost-book company to an incorporated company, it will appear much more like a *bona fide* concern:—

That the 5000 shares into which the capital of the company is divided, and upon which the sum of 15s. per share has been paid, be cancelled, and that in lieu thereof 5000 new shares of 2l. be created. That each of the said new shares be considered as having 15s. paid-up, and that every shareholder be entitled to receive one such share in consideration of each original share held by him.

That this company be forthwith registered as the "Willow Bank Lead Mining Company," under the Joint-Stock Companies Act, 1856.

That Messrs. George Sharp, William Keene, Thomas Sly, and John Green be added to the committee of management, and that they, together with Messrs. George Berkeley, Charles Fortune, and William Fate be the first directors of the company, and be authorised to sign the requisite documents for the registration of the company.

That the regulations in table B, in the schedule annexed to the Joint-Stock Companies Act, 1856, be the regulations of the company.

In referring to this subject in our last, we urged the necessity for the unqualified adoption of table B, and our arguments apply with increased force to companies registered with *un*-limited liability, as from each shareholder's risk being considerably larger, there is much more to fear from leaving too much power in the hands of unscrupulous directors and secretaries. The advantages of this code of regulations are enormous; the shareholders have ample power to carry on their business in the manner they consider best calculated to promote their interest, whilst the secretary and directors are made to understand that they are in the pay, and subject to the guidance, of the shareholders, instead of being, as they too frequently consider themselves under the present system, their rulers. If the shareholders prefer abandoning the management to those in power, of course there is no necessity for adopting table B, but the security is considerably greater, and consequently public confidence in the undertaking must be increased, when that table is permitted to remain unaltered as the regulations of the company.

Let us now consider the widely different position of an individual shareholder in an "unregistered" company, and in a company registered under the new Act with *un*-limited liability. We will suppose the mine in question, on Jan. 1, 1857, to be in debt to the amount of 3000l., and a creditor to petition the Court of Chancery to wind it up, it being an "unregistered" company, and the cost of winding-up an additional 3000l. It is evident, then, that any shareholder might be rendered liable for the whole 6000l., as he is prevented, by clause 4 of the new Act, from compelling his co-partners to participate in the loss—to many this would be ruinous, and to all extremely aggravating. But, suppose the company to be precisely the same amount in debt, and to have been incorporated under the new Act, the liability of an individual holder of five shares would be reduced to 1-1000th part, and even allowing that the costs of winding-up were, from the number of contributories to be applied to, doubled, the liability would not exceed 2l. per share. We trust our instructions will suffice to give shareholders an idea of the course to be pursued to avail themselves of the new Act, whether with or without limited liability; whilst there can be no doubt that, if our assertions are correct, few legitimate adventurers will be reckless enough to continue their connection with unregistered companies, whatever may be their prospects.

CORNISH STEAM-ENGINES.

Abstract from *Browne's Cornish Engine Reporter*, from Aug. 21 to Sept. 21:—

PUMPING ENGINES.		
Number reported		24
Average load per square inch on the piston, in lbs.		14·8
Average number of strokes per minute		5·5
Gallons of water drawn per minute		3254
Average duty of 11 engines, being million lbs. lifted 1 ft. high by the consumption of 1 cwt. of coals		70·0
Actual horse-power employed per minute		828·1
Average consumption of coals per horse-power per hour, in lbs.		3·4
ROTARY ENGINES.—WHIMS.		
Number reported		17
Number of kibbles drawn		32,076
Average depth from which they are drawn, in fms.		141·7
Average number of horse-whim kibbles drawn the average depth by consuming 1 cwt. of coals		50·5
Average duty of 10 engines, as above		18·0
STAMPING ENGINES.		
Number reported		5
Average number of strokes per minute		9·6
Average duty of two engines, as above		44·1
PUMPING ENGINES DOING HIGHEST DUTY.		
Fowey Consols, 80 in. single	Million lbs.	94·7
Par Consols, 80 in. single	,,	94·6
Great Polgooth, 80 in. single	,,	90·2
West Fowey Consols, 60 in. single	,,	73·8
Pembroke and East Crinnis, 80 in. single	,,	73·4
Par Consols, 72 in. single	,,	73·0
WHIM ENGINES.		
Fowey Consols, 22 in. double	Million lbs.	25·8
Par Consols, 24 in. single	,,	22·9
Fowey Consols, 13 in. double	,,	20·0
Par Consols, 24 and 13 in. Sims' combined	,,	19·3
Great Polgooth, 22 in. double	,,	19·2
STAMPING ENGINES.		
Great Polgooth, 35 in. double	Million lbs.	53·1
South Caradon, 26 in. single	,,	35·0

Ventilating Apparatus for Tunnelling.—A modification of the air-trunk ventilator has been employed with great success in the drifts of the recently constructed Merthyr tunnel. It was found advisable to drive a single heading 7 ft. by 6 ft. The shaft was 94 yards in depth. An iron pipe, 1 in. in diameter, being brought from a cistern at the top down a trough branched off at the bottom on each side, and terminated in two roses, or bell-mouths. The escape of the water was regulated by cocks, and six holes, each one 16-in. in diameter, were drilled into each rose. The top end of the pipe was turned horizontally, ending in a rose pierced with still more minute holes, to exclude dirt. The enormous pressure forced out the water like a blast of condensed steam. The current of air attained a velocity of about 1200 lineal feet per minute, through a trough of 10 in. square, and nearly 800 yards long, clearing out the smoke from the working face, and returning by the heading to the shaft. The other branch pipe and jet performed a similar office for the tunnel on the other side of the shaft. The discharge of water from each rose would not exceed a fraction of a cubit foot per minute, and it ran out to the open end of the funnel. The application of this method to sink shafts needs no recommendation. The water can be readily intercepted before it reaches the bottom of the shaft. This application of water is capable of great extension. Pipes of 2 or 3 in. diam. can be connected with the pumps, or with water confined by tubbing in the shaft, or be brought down from the surface, and the water can be discharged through a number of holes sufficiently small to break it up into the finest spray, but with sufficient momentum to spread outwards and fill the area of the shaft.

Water as a Ventilating Power.—This application of water has been long known in some mining districts, and where a head of water can be obtained on a hill side, and there is a level or adit to conduct the water away after having performed its duties in falling from a sufficient height, it is probably the most economical ventilating power. The air trunk used on the Continent for ventilation has been found to yield a useful effect, amounting to about 15 per cent. of the motive power. The cylinder or supply pipe is made large enough to take the required quantity of water. The lower cylinder or trunk is made about three times the area of the upper. There are a number of sloping holes through which the air is drawn, and the water, by its fall and by breaking on the sloping block, ejects the air by an air trough. In one instance the air is forced through a tube of 4 in. in diameter and 450 yards in length, after leaving the machine for the purpose of ventilating part of a mine. The height of the fall is 30 ft., and the compression of the air is measured by 33 in. of water. The water supply pipe has been made as much as 9 in. in diameter, with a discharge of water 100 cubit feet per minute. It was thought by some that several air trunks of 16 ft. fall, each placed one below the other, produce more ventilation than a long one possessing their united fall.

Caloric Engine.—M. Louis Arnier, of Marseilles, has patented some improvements in condensing air and obtaining motive power therefrom. The apparatus consists of a rarefier, in which the atmospheric air is heated and gets its expansive power; a cylinder, provided with a driving piston, which is acted upon by the air coming from the rarefier; a condenser, which sucks the air out of the driving cylinder when part of the expansive power has been wasted, and at the time the piston has reached the end of its run; an air-pump, which sucks the air out of the condenser. The rarefier consists of a cast-iron chamber, coated all round with sheet iron, enclosing a fire-place, the side walls of which are made of fire-bricks; round this rarefier there are vertical flues, through which the smoke goes before reaching the chimney. The rarefier is laid beneath the foundation plate of the machine; its bottom is concave, in order to form a sort of vault above the fire-place for the flame staying there the longer possible before entering the flues, hence to fly out through the chimney. In the inside of the rarefier there is a bundle of wire gauze, through which the air must go before reaching the driving cylinder, the said wire gauze being calculated to secure a same and constant temperature to the motive gas. The cylinder is fitted on the foundation plate of the machine, its distributing box communicating on one side with the rarefier which generates the motive gas, and on the other side with the condenser, which sucks the air at every stroke of the piston. In the inside of the cylinder there is the driving piston, to which are jointed two rods, connected with a rectangular piece, itself in connection with the shaft of the machine, which it gives motion to by means of a crank. On the same rectangular piece a piston rod of the air-pump is fitted; the length of stroke of the two pistons (the pump piston and the cylinder piston) is the same, the only difference is in their diameter. The condenser consists of tubes inserted into larger tubes, which are laid in a reservoir, the said reservoir being filled with cold water, which may be renewed. The smaller tubes convey the atmospheric air to the rarefier. The larger tubes serve to lead to the condenser the heated air that evolves from the motive cylinder when part of its expansive power has been wasted in working the piston. The condensed air-pump is laid on the foundation plate, and is made to communicate with the condenser arranged beneath the said foundation plate. On the slide box of the same pump is the tube for emitting the condensed air, and also a clack-valve intended to prevent the atmospheric air from being put into communication with the inside of the pump on that very side where a vacuum has just been effected, till, by the progress of the piston, the internal air is placed in equilibrium with the external air. Over the condenser there is a valve, communicating with the tubes that serve for the admission of the atmospheric air into the rarefier.

Marine Locomotive.—Mr. William Lonsdell, a machinist, of Memphis, U.S., has invented what he terms a marine locomotive, and which is designed to be substituted for the present steam water craft, by making the base of the boat the propelling agent instead of paddle-wheels, as now used. The invention consists in using two huge parallel hollow screws in the place of the present keel, and revolving them by means of steam-power, so that they will cut their way through the water as a common screw cuts into wood. The screws are constructed of iron, and, as before stated, are hollow, but are divided into compartments as a precaution against sinking, in case of an accident. The cabin of the locomotive will be constructed on frame work, elevated above these screws, and will altogether be more pleasantly situated than the cabins of our river steamers, admitting the passage of fresh air beneath its whole length and breadth. It is believed that when fairly put upon the water, and under advantageous circumstances, the locomotive can make about thirty miles an hour, and thus compete with our railroad trains in speed as well as safety. The model has been put upon trial, and has performed to the satisfaction of the inventor and numerous witnesses.—*Washington Star.*

TREBURGETT CROWAN CONSOLIDATED COPPER MINING COMPANY (LIMITED BY ACT OF PARLIAMENT).

SITUATE IN THE PARISH OF CROWAN, THE BEST MINING DISTRICT IN CORNWALL.

Capital £50,000, in 5000 shares of £10 each.—Deposit £5 per share.
The old shares of £1 each in the Treburgett Consols Mine will be received in exchange, and in payment of the deposit of £5 per share.

MANAGING DIRECTOR—John Pace, Esq., 9, Austinfriars.
BANKERS—Unity Bank, Unity-buildings, Cannon-street.
SOLICITORS—Messrs. Baker and Knight, 34, Lime-street.
BROKER—Peter Watson, Esq., 57, Threadneedle-street.
SECRETARY—Mr. William Evans.

OFFICES,—No. 9, AUSTINFRIARS, LONDON.

Applications are yet required for the 3000 shares unsold; the whole must be applied for prior to an allotment being made.

The capital of the company is £50,000, divided into 5000 shares of £10 each, whereupon a deposit of £5 per share is to be paid, and the remainder called for as required for the mining operations, by instalments not exceeding 2s. 6d. per share, and that at intervals of not less than three months.

Prospectuses may be obtained at the offices of the company.

WILLIAM EVANS, Sec.

FORM OF APPLICATION FOR SHARES.

To the Directors of the Treburgett Crowan Consolidated Copper Mining Company (Limited).

GENTLEMEN,—I request you to allot me shares in your company, of £10 each, on which I enclose you a deposit of £1 per share, and hereby undertake to accept such shares, or any less number, and to pay the further sum of £4 per share on allotment, and the further calls as required, up to £10 per share, subject to the provisions of the Act of Parliament which limits liability to shareholders.

I am, Gentlemen, your obedient servant,
Name in full.....
Residence .....
Profession or business .....

SLATE SLABS AND ROOFING SLATES.—

The PROPRIETORS of the NEW MACHNO SLATE and SLAB COMPANY (LIMITED) have, at great cost, made arrangements to convey their produce from their quarries near Ffestiniog to Conway, to obtain the great advantage of access to the railway, giving them the facility of executing orders without the slightest delay. They trust that making Conway their shipping port will not cause them to be confounded with those hitherto known as the CONWAY SLATES, as the MACHNO SLATES are ENTIRELY FREE from PYRITES, or any metallic substance liable to OXIDATION; and, from having been tested in Wales for at least half-a-century, are found to attain a degree of hardness, by exposure to the atmosphere, unknown in any other vein. The MACHNO SLABS are too well known to need comment, but the annexed valuable testimonial from Mr. Magnus, and also a strong chemical test to which they have been subjected, will better explain their quality:—

Pimlico Slate Works, Upper Belgrave-place, London, April 7, 1855.—GENTLEMEN: I very readily offer my testimony to the excellence of your slabs raised at the Machno Quarries. I prefer them to all others obtained in North Wales, with one exception, and that is much of the same quality as the Machno. The slabs can be obtained of large sizes, and of every requisite thickness. They are homogeneous in texture, strong, of good colour, free from spots and other impurities, pleasant to the tool of the mason, easily planed and moulded, and will bear exposure to a much higher degree of heat than slabs from any of the Carnarvonshire quarries.

Signed, G. E. MAGNUS.

To the Proprietors of the Machno Slate and Slab Quarries.

Liverpool, Oct. 18, 1855.—DEAR SIR: The experiments which I have tried on the specimen of slate, in reference to its capability of resistance to acids, enable me to pronounce it in every way capable of retaining boiling vinegar, without injury either to its own substance, or to the contained vinegar. A piece of the slate, weighing 95 grs., was exposed for 26 hours to the action of cold strong nitric acid; it was then boiled in the same acid for 20 minutes, and when washed, dried, and weighed, was found not to have lost perceptibly in weight. This I consider the most conclusive experiment. Signed, GEO. C. HUSON.

Wm. Orme Carter, Esq., Machno Slate and Slab Company.

All communications must be addressed to the resident director, Mr. T. H. WHEELER, Conway, North Wales.

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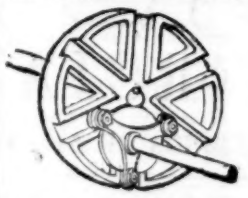

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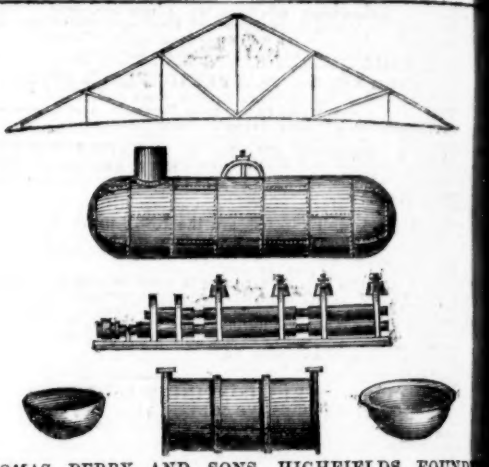

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